RESEARCH PAPER

Montreal Economic Institute

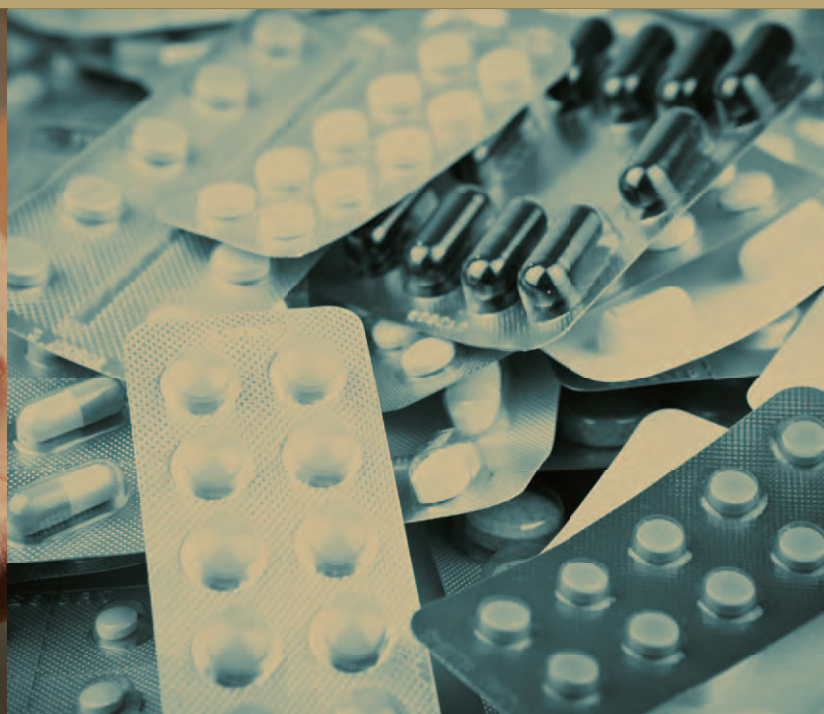
Ideas for a More Prosperous Nation

JUNE 2013

WRONG PRESCRIPTION

The Unintended Consequences of Pharmaceutical Cost Containment Policies

YANICK LABRIE



Montreal Economic Institute
Ideas for a More Prosperous Nation

910, Peel Street, Suite 600
Montreal (Quebec)
H3C 2H8, Canada

Phone: 514-273-0969
Fax: 514-273-2581
Website: www.iedm.org

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Yanick Labrie

Economist and health care policy analyst

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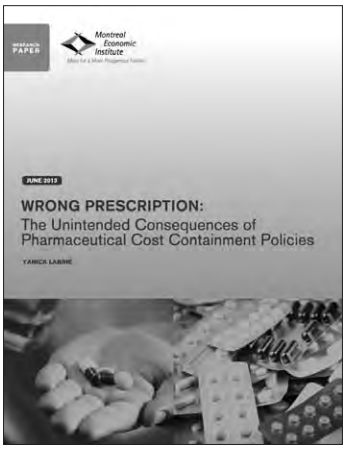
Table of Contents

Executive Summary



Since the start of the new millennium, several working groups and commissions have been charged by various governments with the task of analyzing the financial viability of Canada's public health care plans. Most of the resulting reports sketched a worrisome picture of the expansion of health care spending and highlighted the importance of taking steps to slow this growth.

Indeed, public health care spending takes up an increasing share of government budgets and is becoming harder and harder for governments to finance.

According to a widespread notion, the growth in public health care spending has accelerated primarily because of a large increase in spending on prescription drugs. For governments on the lookout for savings, drugs have therefore become a target of choice.

Like most developed countries, Canada has adopted a good number of policies aiming to control pharmaceutical spending. These policies come in various forms: price caps, drug reimbursement limits (formularies), cost-effectiveness analyses, bulk purchasing, etc.

This *Research Paper* provides an overview of the main pharmaceutical cost containment policies put in place in Canada while casting a critical eye on the negative consequences that they entail for the population.

As the author shows, some of these measures actually deepen supply difficulties and heighten the risks of drug shortages. This is especially true of price caps and bulk purchasing policies. He points out that the increasing cases of shortages seen in recent years are mainly shortages of generic drugs, and that this coincides with the continued lowering of prices caps by provincial governments.

Other policies, like reimbursable drug formularies and cost-effectiveness analyses, have the effect of significantly restricting and delaying the reimbursement of new drugs by public insurance plans. Barely 21% of the new drugs approved by Health Canada from 2004 to 2011could be found on the lists of products covered by provincial drug insurance plans as of December 2012. During this period, the average delay before new drugs became reimbursable by public plans was 659 days.

These ill-advised policies not only reduce patients' access to current drugs, but also discourage investments in R&D, which are necessary for the advent of new drugs in the future.

It is of course altogether laudable for governments to want to manage public finances more rigorously and make more careful use of public funds. Spending on prescription drugs must not be looked at in isolation, however. In many cases, new drugs actually reduce overall health care spending. Indeed, innovative pharmaceutical technologies have increasingly replaced costlier kinds of medical treatments over the years, especially surgeries requiring hospitalization.

Public policy debates regarding the growth in spending on drugs and ways to slow that growth too often lose sight of the many pharmaceutical improvements we have enjoyed over the years. Even if they are expensive, new drugs continue

to provide enormous benefits to patients. They help to prolong and improve their lives, as many empirical studies show.

Therefore, rather than trying to control costs through measures based on regulation, centralization and rationing, the author suggests that governments should instead reduce the obstacles to accessing new drugs. This would allow patients to benefit more quickly from the numerous advantages they offer.

INTRODUCTION

Since the start of the new millennium, several working groups and commissions have been created by various governments for the purpose of analyzing the financial viability of Canada's public health care plans. Most of the resulting reports not only sketched a worrisome picture of the expansion of health care spending, but also highlighted the importance of governments taking steps to slow this growth, which will become less and less sustainable as the population ages.

Over the course of the last decade, public health care spending in Canada has continued increasing faster than economic growth on average, and is becoming harder and harder for governments to finance. From 2000 to 2012, public health care spending grew at an average pace of 6.3% per year, while the average growth rate of the economy was just 4.3% during this period.[1] As a result, health care spending takes up an increasing share of government budgets. According to the latest available data, the share of provincial and territorial program spending devoted to health care expenditures reached 38% in 2011.[2]

A widespread notion has it that the growth in health care spending has accelerated in recent years primarily because of a large increase in spending on prescription drugs. For governments on the lookout for savings, drugs have therefore become a target of choice.

Most developed countries have set up a whole range of policies aiming to bring under control pharmaceutical spending. These policies come in various forms: price controls, profit caps, cost-effectiveness analyses, drug reimbursement formularies, bulk purchasing policies, etc. Canada has not escaped this trend, in fact putting in place a good number of such policies.

The objectives of this Research Paper are two-fold. First, it will try to illustrate that prescription drugs are not merely a source of expenses, but that they also deliver significant benefits to society that are too often neglected in public debates. Second, it will seek to demonstrate the ways in which ill-advised cost containment policies can both reduce access to innovative drugs today and slow the pharmaceutical innovation that is necessary for the development of the drugs of tomorrow.

1. Canadian Institute for Health Information, *National Health Expenditure Trends, 1975 to 2012*, October 2012; Statistics Canada, *Gross domestic product, expenditure-based*, CANSIM Table No. 380-0064.
2. Canadian Institute for Health Information, *ibid.*, p. 65.

CHAPTER 1

The Costs and Benefits of Prescription Drugs

1.1 Spending on Prescription Drugs in Canada

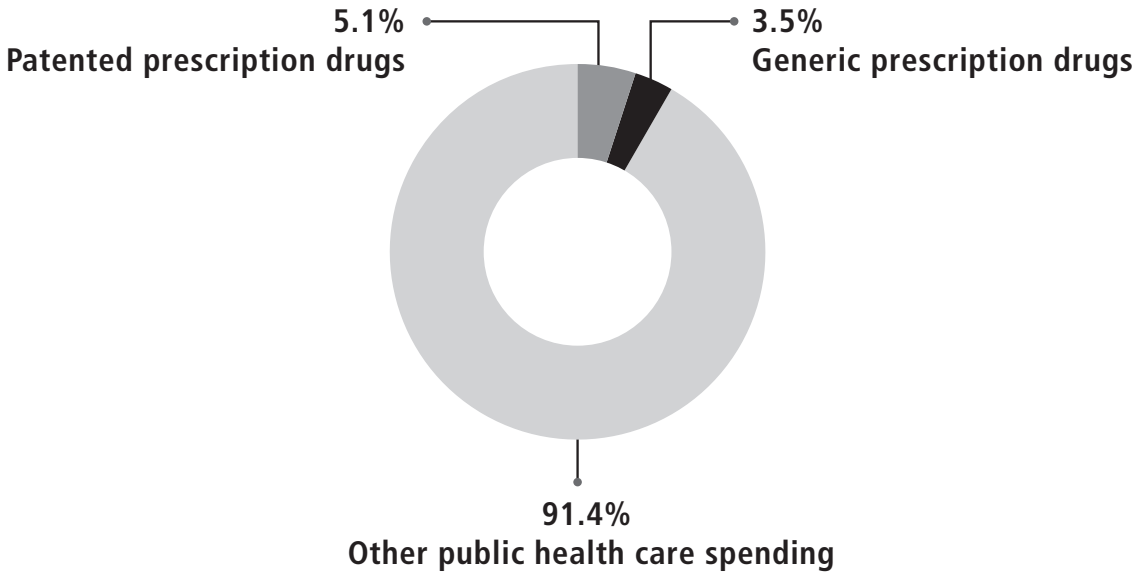
It is no secret that spending on prescription drugs has been growing rapidly since the mid-1970s. In Canada as a whole, it increased by an average of 9.7% per year between 1975 and 2012, which is much faster than the economy and the general price level have been growing. This increase is obviously the result of a complex mixture of factors linked to demographic growth and to the population growing both older and richer, among other things.

Despite this increase, spending on prescription drugs accounts for just a small proportion of public health care expenditures. In 2011, the share of Canada's public health care spending dedicated to prescription drugs was 8.6%, a percentage that has remained relatively stable for the past decade. As for patented drugs specifically, they represented just 5.1% of public health care spending (Figure 1), a drop from 2005 when their share was 6.4%.[1]

It is therefore hard to maintain that the amounts spent on drugs are the primary factor causing the significant growth in public health spending seen in recent years. For the sake of comparison, during the same year, current operating expenses for hospitals and other establishments as well as spending on doctor remuneration represented 48.7% and 20.3% of total public health care spending respectively.[2]

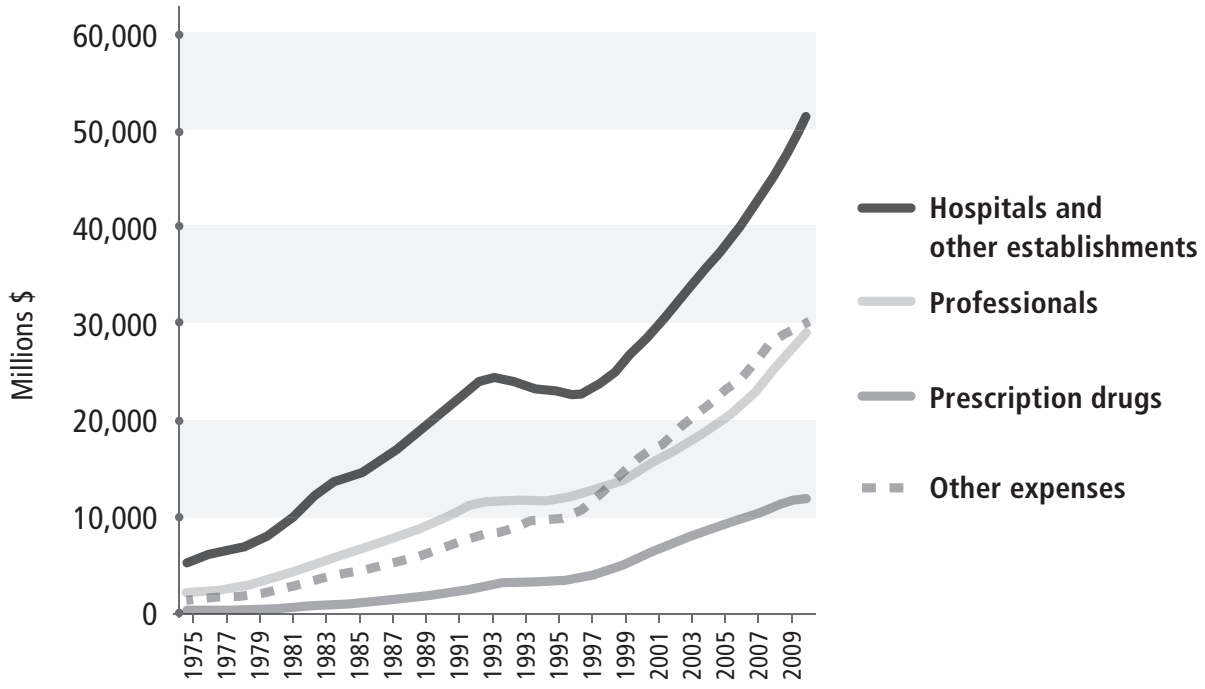
1. Canadian Institute for Health Information, *ibid.*, p. 145; Patented Medicine Prices Review Board, *Annual Report 2011*, Table 7, p. 16.
2. Canadian Institute for Health Information, *ibid.*, p. 146.

Figure 1
Proportion of total public health care spending dedicated to prescription drugs, 2011



Sources: Canadian Institute for Health Information, *National Health Expenditure Trends, 1975 to 2012*, October 2012, p. 145; Patented Medicine Prices Review Board, *Annual Report 2011*, Table 7, p. 16.

Figure 2
The evolution of public health care spending in Canada, by allocation of funds, 1975-2010



Source: Canadian Institute for Health Information, *National Health Expenditure Trends, 1975 to 2012*, October 2012.

For several years now, the growth rate of spending on medicines has been slowing, in part due to the expiry of numerous patents, but also due to certain governmental policies explicitly aimed at slowing that progress. In fact, this rate of growth has fallen significantly for decades and is now among the lowest for all categories of health care spending. As shown in Figure 3, other categories of expenditures have generally risen more rapidly than spending on drugs since 2005.

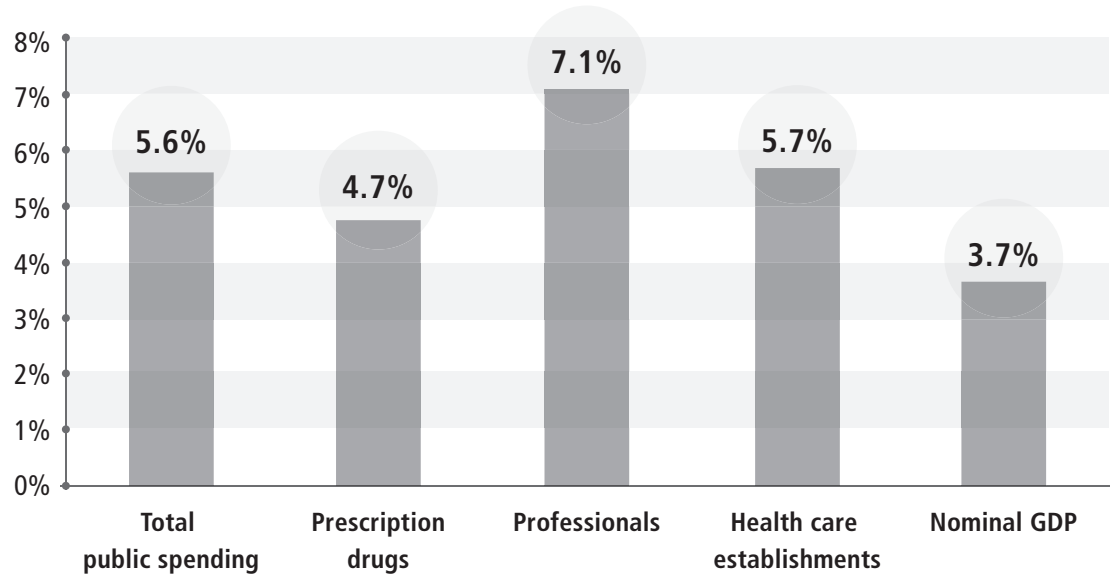
Drug expenses: a burden for Canadians?

In 2010, spending on prescription drugs in Canada stood at $759 per capita. Of this amount, 45.5% was covered by public insurance plans, 35.8% was taken up by private insurers, while personal spending accounted for the remaining 18.7%.[3]

For the Canadian population as a whole, personal spending on prescription drugs per household remains relatively low. In 2010, the amount that Canadian households had to spend to purchase prescription drugs was $491 on average, accounting for just 0.7% of their total expenses (Figure 4). In comparison, Canadian households spent $3,539 on leisure products and services, $3,452 on clothing and accessories, $1,149 on tobacco products and alcoholic beverages, $731 on cellular phone services and even $453 on pet care during this same year.

3. Canadian Institute for Health Information, *Drug Expenditure in Canada, 1985 to 2012*, April 2013, p. 24.

Figure 3
Public health care spending by allocation of funds, average annual growth 2005-2012



Sources: Canadian Institute for Health Information, *National Health Expenditure Trends, 1975 to 2012*, October 2012; Statistics Canada, *Gross domestic product, expenditure-based*, CANSIM table 380-0064.

As for households whose members are 65 and older—those most likely to need to buy medicines—the picture is not all that different. Spending on prescription drugs represented on average just 1.6% of total spending for these households. Like the general population, Canadians aged 65 and older spend, as a proportion of their budgets, as much or more on leisure activities (4.4%), clothing and accessories (4.1%), and tobacco products and alcoholic beverages (1.6%) as they do on prescription drugs.[4]

Researchers have recently conducted an in-depth study of the financial burden that different categories of households have to shoulder. They paid special attention to the cases of the households of those 65 and over and of those whose income is drawn primarily from social assistance programs. The results of their research show that a tiny minority of households belonging to these groups must take on catastrophic pharmaceutical expenses over the course of a year. In fact, only 1.1% of households receiving social assistance and 2.5% of households of those 65 and over must devote on average more than 10% of their net incomes to the purchase of prescription drugs.

As the authors point out, however, households belonging to these groups generally enjoy near-complete coverage by their provinces' public drug insurance plans.[5]

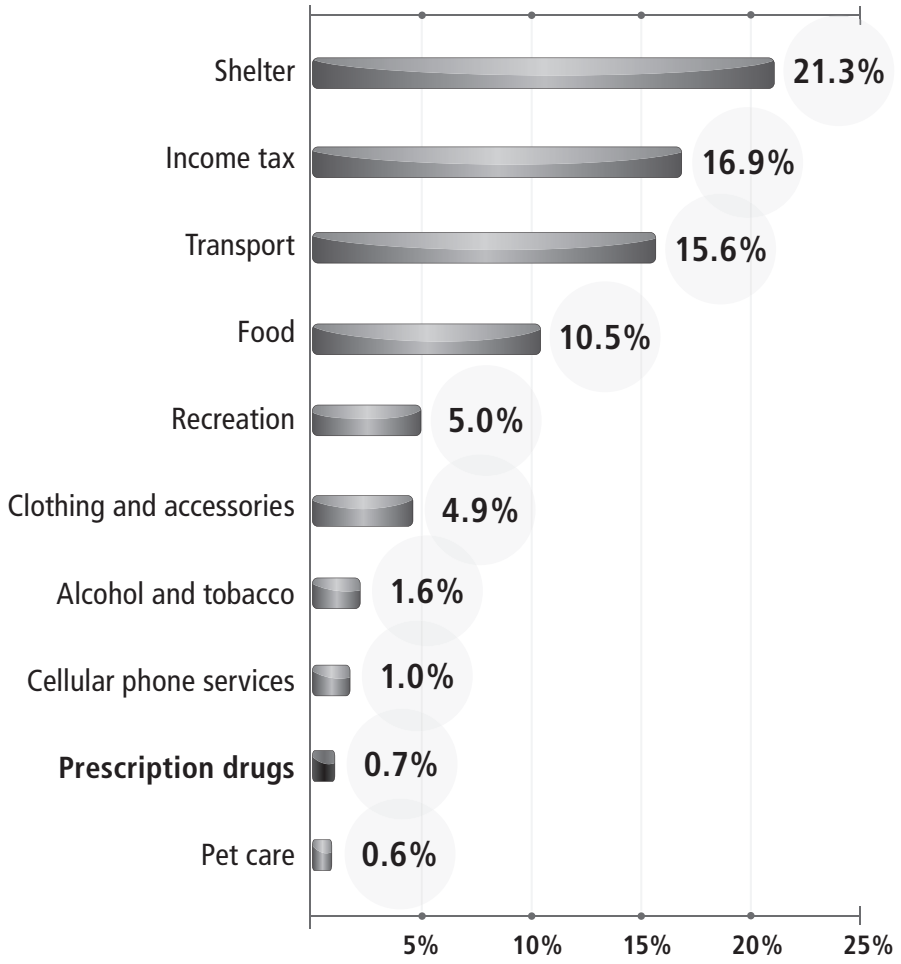
Drugs are expensive… but so is R&D

According to many analysts, rising spending on pharmaceuticals is a direct consequence of the fact that new patented drugs enter the market at higher prices than older drugs. However, as noted by a recent report from the Canadian Institute for Health Information, increased sales volumes for prescription drugs contributed more to the growth

4. Statistics Canada, Detailed Average Household Expenditure by Age of Reference Person for Canada, 2010, *Survey of Household Spending 2010*, Product No. 62-203-X.

5. Logan McLeod *et al.*, "Financial burden of household out-of-pocket expenditures from prescription drugs: Cross-sectional analysis based on national survey data," *Open Medicine*, Vol. 5 (2011), No. 1.

Figure 4
Proportion of total Canadian household personal spending dedicated to prescription drugs, in comparison with other types of spending, 2010



Source: Statistics Canada, Survey of Household Spending 2012.

of spending on pharmaceuticals in recent decades than price increases did.[6] Indeed, the data show that patented drugs are generally sold at lower prices in Canada than in other countries at comparable levels of development like Germany, the United States, France and Switzerland (Figure 5).

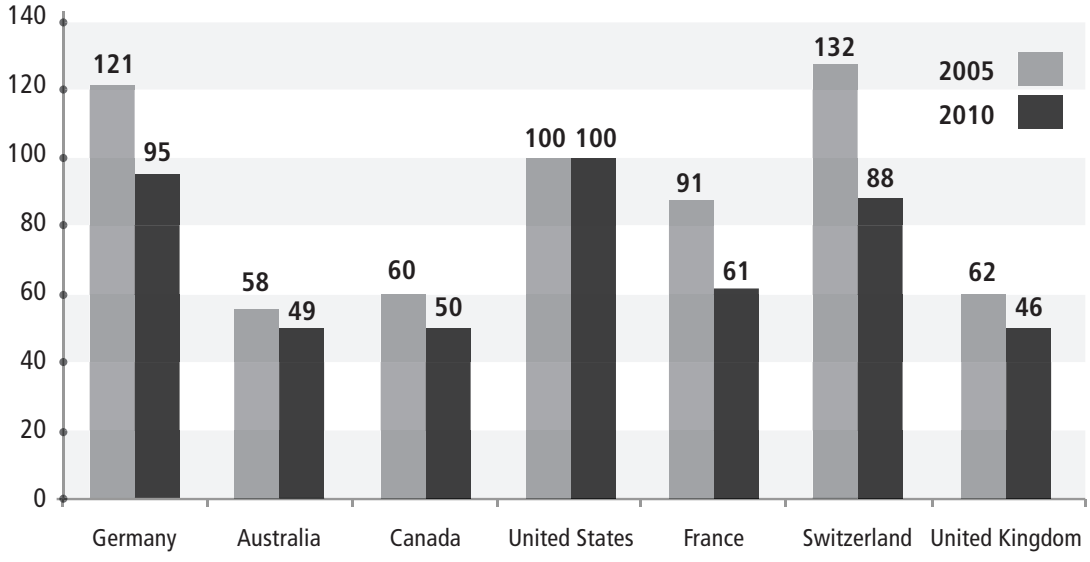
It is true that innovative drugs are sometimes initially marketed at high prices. This is notably the case of drugs used to treat cancer. For example, Herceptin, a drug used to treat breast cancer, costs an average of about $40,000 per patient.[7] Others, like Yervoy, a drug used to fight metastatic melanoma, can cost up to $120,000 per treatment.[8] Nonetheless, since these drugs are used to treat only a tiny proportion of the population, they only represent a small fraction of total sales.[9]

High prices are also necessary to finance the research and development of new drugs. Economic theory teaches us that higher prices for certain drugs

6. Canadian Institute for Health Information, *National Health Expenditure Trends, 1975 to 2012*, October 2012, pp. 29-30.

7. CBC News, "The promise of Herceptin," March 21, 2011.
8. Kate O'Rourke, "Cancer drug costs under scrutiny," *Clinical Oncology News*, Vol. 7, No. 10, October 2012.
9. Canadian Institute for Health Information, *Health Care Cost Drivers: Drugs Expenditure Trends Perspective*, November 2011.

Figure 5
Retail price index for patented drugs in Canada and in six developed countries, 2005 and 2010 (U.S. = 100)



Source: Pavos Kavanos et al., "Higher US branded drug prices and spending compared to other countries may stem partly from quick uptake of new drugs," *Health Affairs*, Vol. 32 (2013), No. 4, p. 756.

have the effect of encouraging pharmaceutical companies to increase their research investments in order to develop new ones.[10]

The development of a new drug is a long, expensive and risky process. Out of 10,000 molecules studied, just one or two are approved by government regulatory authorities and subsequently marketed.[11] On average, pharmaceutical companies must devote 12 to 15 years[12] of research and invest $1.2 billion in order to develop a new drug.[13] For that matter, the cost of developing a new drug has increased substantially in recent decades, as shown in Figure 6.

Researchers at the Congressional Budget Office in the United States have pointed out that only 8% of drugs that reach the clinical trial stage end up being approved for sale.[14] And among all of those that are marketed, only two drugs out of ten generate sufficient sales to cover the average R&D cost (Figure 7).[15] As a result, 20% of drugs on the market must generate enough income to cover the research and development costs of the other 80%, not to mention those of the many projects that had to be abandoned midcourse.

10 Abdulkadir Civan and Michael T. Maloney, "The Effect of Price on Pharmaceutical R&D," *The B.E. Journal of Economic Analysis & Policy*, Vol. 9 (2009), No. 1, Article 15; Carmelo Giaccotto, Rexford E. Santerre and John A. Vernon, "Drug prices and research and development investment behavior in the pharmaceutical industry," *Journal of Law and Economics*, Vol. 48 (2005), pp. 195-214.

11 Fariba Hashemi, "Industry dynamics in pharmaceuticals," *Pharmacology & Pharmacy*, Vol. 3 (2012), p. 2.

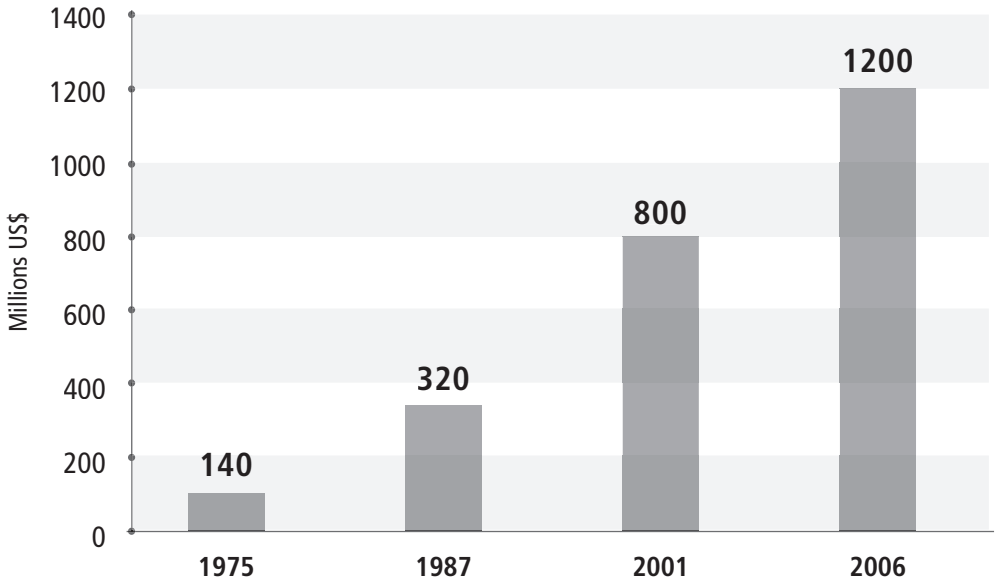
12 Frank A. Sloan and Chee-Ruey Hsieh, "The effects of incentives on pharmaceutical innovation," in Frank A. Sloan (ed.), *Incentives and Choice in Heath Care*, MIT Press, 2008, p. 238.

13 Christopher Paul Adams and Van Vu Brantner, "Spending on New Drug Development," *Health Economics*, Vol. 19 (2010), No. 2, pp. 130-141.

14. Congressional Budget Office, *Research and Development in the pharmaceutical industry*, October 2006, p. 23.

15. John A. Vernon, Joseph H. Golec and Joseph A. DiMasi, "Drug Development Costs When Financial Risk is Measured Using the Fama-French Three-Factor Model," *Health Economics*, Vol. 19 (2010), No. 8, p. 1004.

Figure 6
The cost of developing a new drug



Source: PHRMA, Chart pack-Biopharmaceuticals in perspective, Spring 2013, p. 20.

1.2. The Value of New Drugs

No serious discussion concerning the cost of prescription drugs can ignore the matter of the benefits of those drugs. Unfortunately, debates about public policies regarding the growth in spending on medicines and ways to slow that growth too often lose sight of the many pharmaceutical improvements we have enjoyed over the years. Even if they are expensive, new drugs continue to provide enormous benefits to patients. Most of these drugs help to prolong and improve their lives, as many empirical studies show.

Economist Frank Lichtenberg from Columbia University has been interested in the issue of pharmaceutical innovation for many years. In one study of over fifty countries, he presented data showing that life expectancy in the populations studied had risen by an average of nearly two years from 1986 to 2000, and that the entry of new drugs onto the market accounted for some 40% of this observed increase in longevity.[16] More recently, using data on 30 developed and developing countries, Lichtenberg discovered that 73% of the extension of life expectancy seen over the past decade in those countries is attributable to the arrival of new drugs on the market.[17]

Innovative drugs can, among other things, accelerate a patient's return to work, reduce absenteeism and improve productivity. As a part of his research, Lichtenberg estimated that in the absence of new drugs (marketed after 1995), the proportion of people constrained by disability in the United States would have been 30% higher than its actual level, and that some 418,000 additional working-age Americans would have received public disability insurance benefits.[18]

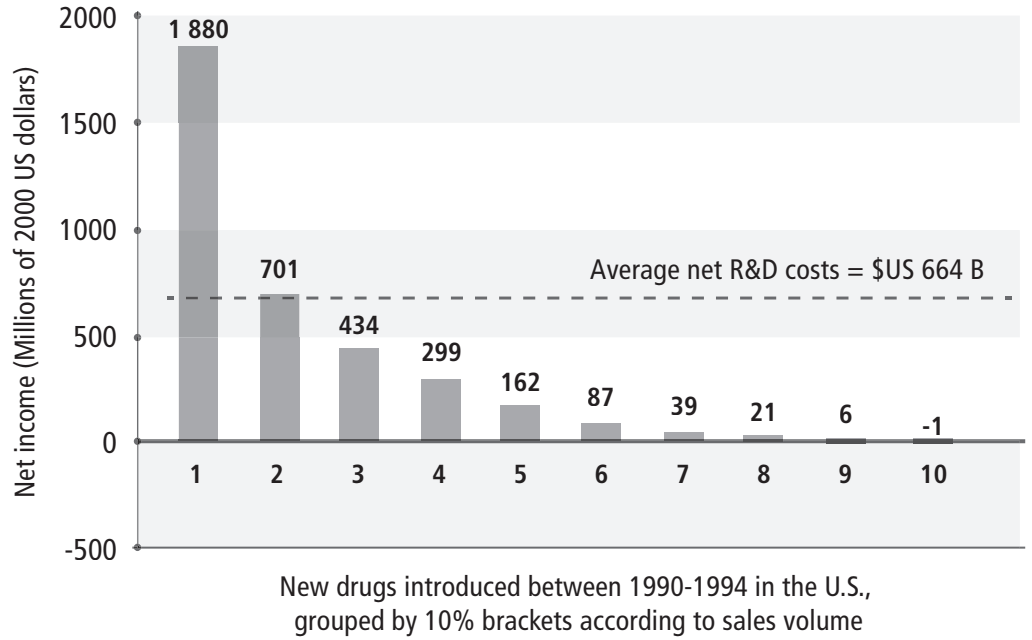
The importance of the role played by innovative drugs in the treatment of hypertension and cardiovascular disease is also well known. A group of researchers led by economist David Cutler from Harvard University showed to what extent the use

16. Frank R. Lichtenberg, "The Impact of New Drug Launches on Longevity: Evidence from Longitudinal, Disease-Level Data from 52 Countries, 1982–2001," *International Journal of Health Care Finance and Economics*, Vol. 5 (2005), pp. 47–73.

17. Frank R. Lichtenberg, *Pharmaceutical innovation and longevity growth in 30 developing and high-income countries, 2000-2009*, National Bureau of Economic Research, Working Paper No. 18235, July 2012.

18. Frank R. Lichtenberg, "Has pharmaceutical innovation reduced social disability growth?" *International Journal of the Economics of Business*, Vol. 18 (2011), No. 2, pp. 293-316.

Figure 7
Only 2 out of 10 drugs generate enough income to cover the average cost of R&D



Sources: PHRMA, Chart pack-Biopharmaceuticals in perspective, Spring 2013, p. 26; John A. Vernon, Joseph H. Golec and Joseph A. DiMasi, "Drug Development Costs When Financial Risk is Measured Using the Fama-French Three-Factor Model," *Health Economics*, Vol. 19 (2010), No. 8, p. 1004.

of drugs to control hypertension and hyperlipemia led to significant reductions in mortality and morbidity in patients afflicted by these health problems. Cutler and his colleagues estimated that blood pressure levels would be 10% to 13% higher on average without the use of drugs to treat hypertension. The authors report that thanks to these drugs, 86,000 premature deaths resulting from cardiovascular trouble were averted in the United States just in 2001.[19]

In Canada, studies have also shown that spending on prescription drugs has played a significant role in the improvement of general health indicators in the population, like the infant mortality rate and life expectancy at birth and at age 65. In one of these studies, economist Pierre-Yves Crémieux from the Université du Québec à Montréal and his colleagues concluded that "[w]ere each province to have undertaken drug spending equivalent to the average of the two provinces with the highest expenditures, an average of 584 fewer deaths per year, or up to 10,509 fewer deaths during the first year of life would have been observed since 1981. In addition, life expectancy at birth would have been on average 8 months higher every year than what it actually was for males, and five months higher for females."[20]

In a study of Canadian data, a group of researchers led by Frank Lichtenberg examined the effects of new drugs on the survival rates of Quebecers 65 and older who were suffering from cancer, cardiovascular disease or asthma. Once again, the observed results are impressive: The introduction of new drugs was associated with a 51% reduction in mortality in the population studied, as compared to older drugs (marketed before 1970).[21]

19. David M. Cutler *et al.*, "The Value of Antihypertensive Drugs: A Perspective on Medical Innovation," *Health Affairs*, Vol. 26 (2007), No. 1, pp. 97-110.

20. Pierre-Yves Crémieux *et al.*, "Public and private pharmaceutical spending as determinants of health outcomes," *Health Economics*, Vol. 14 (2005), pp. 107-116.

21. Frank R. Lichtenberg *et al.*, "The impact of drug vintage on patient survival: A patient-level analysis using Quebec's provincial health plan data," *Value in Health*, Vol. 12 (2009), No. 6, pp. 847-856.

Medicines can replace more expensive treatments

For many diseases, medicines remains both the most effective and the least expensive treatment. This is notably the case for mental illnesses like depression and schizophrenia. A study published in the *Journal of Clinical Psychiatry* using American data showed that increased spending on antidepressant drugs during the 1990s allowed more patients to be treated while reducing both the number and the duration of hospital stays. The annual cost per patient therefore fell by 19% over this period, from $4,072 to $3,309.[22]

In many cases, new drugs tend to lower overall spending on health care by reducing the need to resort to other, more expensive categories of medical care.[23] Indeed, innovative pharmaceutical technologies have increasingly replaced costlier kinds of medical treatments over the years, especially surgeries requiring hospitalization.

Many studies carried out in the United States in recent decades have shown that for each dollar spent on prescription drugs, overall health care expenditures have been reduced by an amount between $2.06 and $2.65.[24] Spending on more recent patented drugs produced even larger savings elsewhere in the health care system.[25] Economists are noting that this is also the case in Canada.[26]

Obviously, there are health risks associated with drugs that can in some cases lead to serious complications that may require hospitalization.[27] However, with advances in pharmacogenetics and personalized medicine, doctors are increasingly able to reduce these risks by prescribing made-to-measure drugs that take patients' genetic profiles into account. These innovations can substantially improve survival rates while also greatly reducing the risks of toxicity and side effects related to the use of medicines, not to mention hospitalization rates.[28]

For example, trastuzumab, better known under the brand name Herceptin, was one of the first drugs to use advances in genomics research to fight diseases, some of which were incurable not so long ago. Prescribed for certain patients suffering from an unusual and particularly aggressive type of breast cancer, this drug proved capable of substantially improving survival rates while also reducing the incidence of harmful side effects normally associated with chemotherapy like hair loss and digestive problems.[29]

Pharmaceutical innovation: a gradual process

Despite the notable advances achieved by the pharmaceutical industry and the considerable benefits that have ensued, certain analysts continue to believe that spending on drugs remains too high compared to the real advantages they provide. They maintain that the majority of new drugs that enter

22. Paul E. Greenberg *et al.*, "The economic burden of depression in the United States: How did it change between 1990 and 2000?" *Journal of Clinical Psychiatry*, Vol. 64 (2003), No. 12, pp. 1465-1475.
23. Frank R. Lichtenberg, "Have newer cardiovascular drugs reduced hospitalization? Evidence from longitudinal country-level date on 20 OECD countries, 1995-2003," *Health Economics*, Vol. 18 (2009), No. 5, pp. 519-534.
24. Frank R. Lichtenberg, "Do (more and better) drugs keep people out of hospitals?" *American Economic Review*, Vol. 86 (1996), No. 2, pp. 384-388; Baoping Shang & Dana Goldman, *Prescription drug coverage and elderly Medicare spending*, National Bureau of Economic Research, Working Paper No. 13358, September 2007.
25. Frank R. Lichtenberg, "Benefits and costs of newer drugs: an update," *Managerial and Decision Economics*, Vol. 28 (2007), pp. 485-490; Abdülkadir Civan and Bülent Köksal, "The effect of newer drugs on health spending: Do they really increase the costs?" *Health Economics*, Vol. 19 (2010), pp. 581-595.
26. Pierre-Yves Crémieux, Pierre Ouellet and Martin Petit, "Do drugs reduce utilisation of other healthcare resources?" *Pharmacoeconomics*, Vol. 25 (2007), No. 3, pp. 209-221.
27. Without wanting to minimize the terrible consequences for patients who suffer from them, we must recognize that these risks are lower than many others that most people willingly accept on a daily basis, like driving a car. See in this regard: Joshua Cohen and Peter J. Neumann, "What's more dangerous, your aspirin or your car? Thinking rationally about drug risks (and benefits)," *Health Affairs*, Vol. 26 (2007), No. 3, pp. 636-647.
28. Robert S. Epstein *et al.*, "Warfarin genotyping reduces hospitalization rates: Results from the MM-WES (Medco-Mayo Warfarin Effectiveness Study)," *Journal of the American College of Cardiology*, Vol. 55 (2010), No. 25, pp. 2804-2812; JA Johnson *et al.*, "Pharmacogenomics: Applications to the management of Cardiovascular disease," *Clinical Pharmacology & Therapeutics*, Vol. 90 (2011), No. 4, pp. 519-531; Edward Abrahams and Mike Silver, "The case for personalized medicine," *Journal of Diabetes Science and Technology*, Vol. 3 (2009), No. 4, pp. 680-684.
29. Edward H. Romond *et al.*, "Trastuzumab plus Adjuvant Chemotherapy for Operable HER2-Positive Breast Cancer," *The New England Journal of Medicine*, Vol. 353 (2005), pp. 1673-1684; Kate McKeage and Katherine A. Lyseng-Williamson, "Trastuzumab: A pharmacoeconomic review of its use in early breast cancer," *Pharmacoeconomics*, Vol. 26 (2008), No. 8, pp. 699-719; PriceWaterhouseCoopers, *The new science of personalized medicine: translating the promise into practice*, 2009, p. 7.

the market are actually carbon copies of existing drugs—commonly called "me-too" drugs—without any real added value.[30] Such criticisms, however, reveal an ignorance of the nature of the innovation process in the pharmaceutical industry.

Generally speaking, technological progress, whatever the sector, occurs only following numerous incremental improvements to existing products and production processes. In this, the pharmaceutical industry is no exception. The advances achieved over time, while seemingly small in the short term, end up being decisive factors to patients' health and quality of life when extended over a number of years. This phenomenon means that we can only measure and appreciate the magnitude of pharmaceutical progress over longer periods.

In the pharmaceutical sector, innovations realized over decades have gradually led to the marketing of drugs that are ever more effective, safer and better tolerated by patients. The fact that nearly two out of three drugs (63%) appearing on the World Health Organization's essential drug list are "me-too" drugs shows the importance of incremental innovation in this industry.[31]

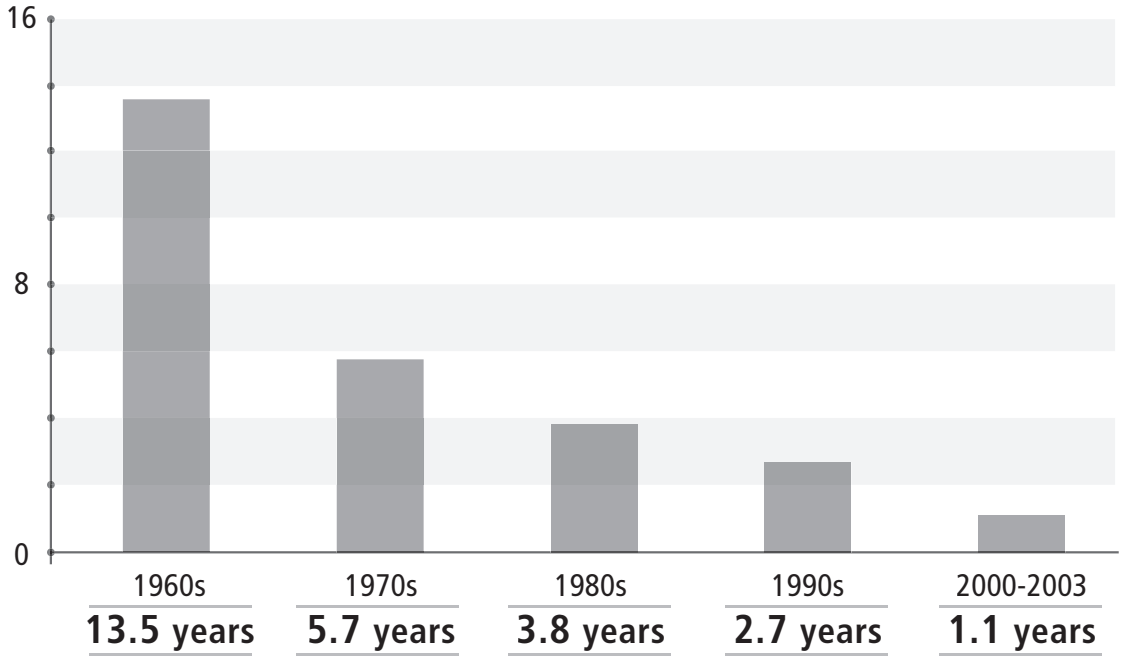
For example, the pioneering beta blocker drug used in cardiology in the 1960s, pronethanol, had undesirable side effects and was quickly replaced by better versions. Research carried out in the 1980s and 1990s then led to the development of more effective beta blockers like carvedilol and metoprolol that proved more effective in treating congestive heart failure. After over four decades of incremental innovation in this area, several versions of "me-too" drugs were designed and are now used to treat a whole array of diseases like arrhythmia, glaucoma, and hypertension.[32]

Indeed, so-called "me-too" drugs are usually innovative products that have simply lost the race to become the first drugs in their particular therapeutic class.[33] These drugs provide patients with benefits that may sometimes appear slight but that are nonetheless very real.[34] For example, improvements in terms of dose or dosage (a pill that only needs to be taken once a day instead of 3 or 4 times) can increase the likelihood that patients will adhere fully to their prescribed treatment, with all of the positive health consequences that this entails.

These products can moreover be in competition with the pioneering drugs in their respective therapeutic classes, which has the effect of offering patients additional options and exercising downward pressure on prices.[35] For that matter, competition has intensified over the years thanks to incremental innovation, as shown by the continual reduction in the amount of time during which a pioneering drug remains alone in its therapeutic class, which has fallen from an average of 13.5 years in the 1960s to 1.1 years at the beginning of the new millennium (Figure 8).[36]

30. See especially: Steven G. Morgan *et al.*, "Breakthrough drugs and growth in expenditure on prescription drugs in Canada," *BMJ*, Vol. 331 (2005), pp. 815-816.
31. J. Cohen, L. Cabanilla and J. Sosnov, "Role of follow-on drugs and indications on the WHO essential drug list," *Journal of Clinical Pharmacy and Therapeutics*, Vol. 31 (2006), pp. 585-592.
32. Desmond Sheridan and Jim Attridge, "The impact of therapeutic reference pricing on innovation in cardiovascular medicine," *Pharmacoeconomics*, Vol. 24 (2006), Suppl. 2, pp. 35-54. See also Philippe Lechat, "Clinical pharmacology of beta blockers in cardiology: trial results and clinical applications," *Hot Topics in Cardiology*, Vol. 10 (2008), pp. 7-44.
33. Joseph A. Dimasi and Laura B. Faden, "Competitiveness in follow-on drug R&D: A race or imitation?" *Nature Reviews Drug Discovery*, Vol. 10 (2011), pp. 23-27.
34. Anapum B. Jena, John E. Calfee, Edward C. Mansley and Tomas J. Philipson, "Me-too innovation in pharmaceutical markets," *Forum for Health Economics & Policy*, Vol. 12 (2009), No. 1, Article 5.
35. Z. John Lu and William S. Comanor, "Strategic pricing of new pharmaceuticals," *Review of Economics and Statistics*, Vol. 80 (1998), No. 1, pp. 108-118.
36. Joseph A. Dimasi and Laura B. Faden, *op. cit.,* note 33, p. 26.

Figure 8
Number of years during which a pioneering drug remains alone in its therapeutic class, 1960 to 2003



Source: Joseph A. Dimasi et Laura B. Faden, « Competitiveness in follow-on drug R&D: A race or imitation? », *Nature Reviews Drug Discovery*, vol. 10 (2011), p. 26.

CHAPTER 2

Pharmaceutical Cost Containment Policies in Canada

2.1 Price Control Policies

In Canada, the price of prescription drugs, whether patented or generic, is heavily regulated by the public authorities. The prices of innovative drugs are fixed upon their entry onto the market by the Patented Medicine Prices Review Board, a federal organization, as a function of the median prices observed in seven industrialized countries (France, Germany, Italy, Sweden, Switzerland, the United Kingdom and the United States).[1] In this way, the organization wants to ensure that drugs still under patent are not sold on the Canadian market at a price deemed to be "excessive." Because of this regulation, the average prices of patented drugs have risen at a lower annual rate than the rate of inflation for 22 of the 24 years from 1988 to 2011 (Figure 9).[2]

These price controls entail a range of unintended consequences, however. Numerous reports show that regulating the prices of patented drugs has the effect of discouraging pharmaceutical investment and the entry of new drugs onto the market.[3] According to a U.S. Department of Commerce study, without the price controls put in place by OECD countries, pharmaceutical spending on R&D would be between $5 and $8 billion higher each year.[4]

In another study released in 2005, economists estimated that if the U.S. government had tried to restrict the growth of drug prices to the same rate as the consumer price index, as many countries did, spending on R&D would have been 30% lower and between 330 and 365 new drugs would not have entered the market in the United States from 1980 to 2001.[5] This represents around 38% of all drugs developed and marketed around the world during this period.

Other studies have also shown that the launch of new drugs is most often successful in countries where there are no price controls.[6] For example, economist Patricia Danzon from the Wharton School of the University of Pennsylvania and her colleagues found that fewer new drugs are marketed in countries with price caps, and only after a delay of several months.[7]

Price caps for generic drugs

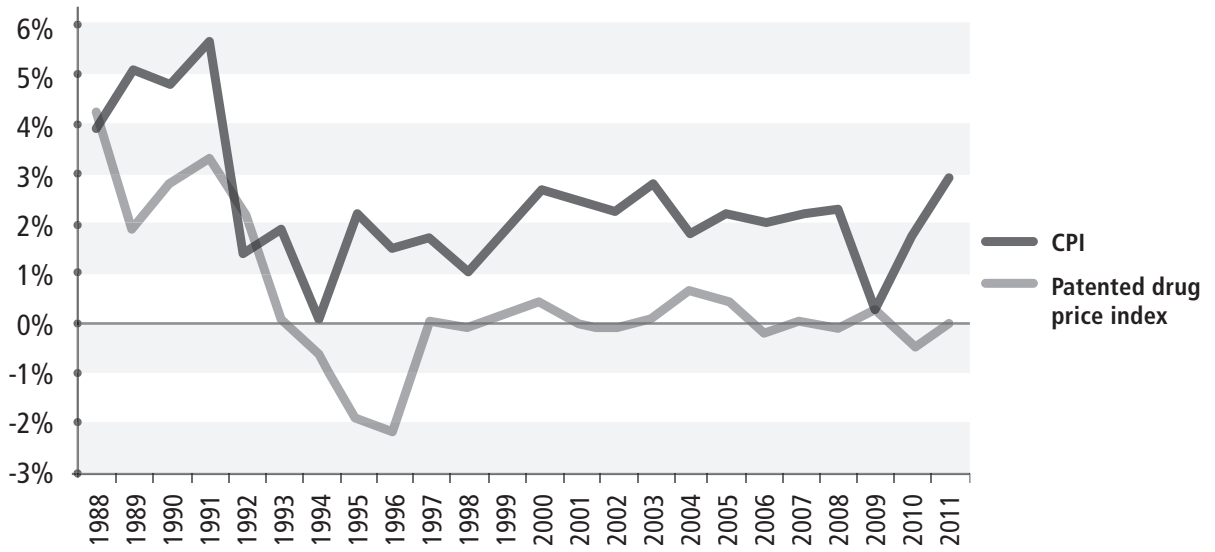
Measures aiming to keep drug prices below a certain level are not restricted to patented drugs. Provincial governments determine a maximum price to be paid for all generic drugs through their public insurance plans. This maximum price varies according to a percentage—from 18% to 35% depending on the province—of the price of the brand name drugs belonging to the same therapeutic class (Table 1).

The Ontario government was the first, in the early 1990s, to adopt a price cap for generic drugs, which it has repeatedly lowered since then. The latest reform put in place in 2010 stipulates that the price of generic drugs can no longer exceed 25% of the reference patented drug price.[8]

Other provinces have followed suit and imposed similar price caps in recent years. In its 2013-2014

1. Patented Medicine Prices Review Board, *Compendium of Guidelines, Policies and Procedures,* June 2011, p. 34.
2. Patented Medicine Prices Review Board, *2011 Annual Report*, p. 19.
3. Margaret K. Kyle, "Pharmaceutical price controls and entry strategies," *Review of Economics and Statistics*, Vol. 89 (2007), No. 1, p. 98.
4. U.S. Department of Commerce, *Pharmaceutical Price Controls in OECD countries: Implications for U.S. Consumers, Pricing, Research and Development, and Innovation*, December 2004.
5. Carmelo Giaccotto, Rexford E. Santerre and John A. Vernon, "Drug prices and research and development investment behavior in the pharmaceutical industry," *Journal of Law and Economics*, Vol. 48 (2005), pp. 195-214.
6. Steven Simoens, "A review of generic medicine pricing in Europe," *Generics and Biosimilars Initiative Journal*, Vol. 1 (2012), No. 1, pp. 8-12.
7. Patricia M. Danzon, Y. Richard Wang and Liang Wang, "The impact of price regulation on the launch delay of new drugs – evidence from twenty-five major markets in the 1990s," *Health Economics*, Vol. 14 (2005), pp. 269-292.
8. Aslam Anis, Stephanie Harvard and Carlo Marra, "Ontario's plunging price-caps on generics: deeper dives may drown some drugs," *Open Medicine*, Vol. 5 (2011), No. 3, p. E149.

Figure 9
Variation in the drug price index and the Consumer Price Index in Canada, 1988-2011



Source: Statistics Canada, Consumer Price Index, historical summary; Patented Medicine Prices Review Board, *2011 Annual Report.*

budget, Alberta announced its intention to set this percentage at 18%.[9] Quebec and Manitoba have for their part adopted a policy according to which all manufacturers of generics must match the best prevailing price in Canada for their products if they want them to be included on the formulary of products that are covered by their public drug insurance plans.

What the provinces are trying to achieve with these price-cap policies is to bring the cost of drug insurance plans under control. But while they may be motivated by the laudable desire to reduce the burden on taxpayers, these policies do not necessarily guarantee good results.

Policies that artificially reduce prices end up making the production of certain drugs simply unprofitable. In the long run, this has the effect of pressuring many pharmaceutical businesses to abandon the production of drugs whose profit margins are too slim and reallocate their resources to the production of other drugs that offer better prospects of profitability.[10] International data also show that price controls for generic drugs, by choking off competition, can paradoxically lead to higher prices.[11]

As various analysts have pointed out, these kinds of measures that prevent occasional price increases when they are needed actually help deepen supply difficulties and heighten the risks of drug shortages.[12] Indeed, the multiplication of cases of drug shortages observed in recent years mainly relates to generic drugs and coincides with the provincial

9. Randy Fielder, "Pharmacists protest 'draconian' cut in prices for generic drugs," *Red Deer Advocate*, April 8, 2013, p. C1.

10. Valerie Jensen and Bob A. Rappaport, "The reality of drug shortages – the case of the injectable agent Propofol," *The New England Journal of Medicine*, Vol. 363 (2010), No. 9, pp. 806-807; Awi Federgruen, "The drug shortage debacle – and how to fix it," *Wall Street Journal*, March 1, 2012.

11. Aslam Anis, Stephanie Harvard and Carlo Marra, *op. cit.*, note 8; Jaume Puig-Junoy, "Impact of European Pharmaceutical Price Regulation on Generic Price Competition," *Pharmacoeconomics*, Vol. 28 (2010), No. 8, pp. 649-663; Patricia Danzon and Li-Wei Chao, "Does regulation drive out competition in pharmaceutical markets?" *Journal of Law and Economics*, Vol. 43 (2000), No. 2, pp. 311-357.

12. Ali Yurukoglu, *Medicare reimbursements and shortages of sterile injectable pharmaceuticals*, Working Paper No. 17987, National Bureau of Economic Research, April 2012; Bill Cassidy and Scott Gotlieb, "Solving the growing drug shortages," *Wall Street Journal*, November 4, 2011.

Table 1
Price caps for generic drugs by Canadian province, 2013

Province	Price caps for generic drugs (as a % of patented drug prices)
British Columbia	25%
Alberta	18%
Saskatchewan	35%
Manitoba	Lowest price in effect in Canada (18%)
Ontario	25%
Quebec	Lowest price in effect in Canada (18%)
New Brunswick	35%
Prince Edward Island	35%
Nova Scotia	35%
Newfoundland and Labrador	35%

Sources: Michel de Paiva, *L'avenir du coût des médicaments. Point de vue des régimes d'assurance-médicaments privés*, IMS Brogan, April 2013; Aslam Anis, Stephanie Harvard and Carlo Marra, "Ontario's plunging price-caps on generics: deeper dives may drown some drugs," *Open Medicine*, Vol. 5 (2011), No. 3, p. E150.

governments' continued lowering of price caps. In Quebec for instance, the number of notices of drug supply disruptions has increased considerably over the past five years, from 33 in 2006 to 207 in 2010 (Figure 10).

Of course, price-cap policies for drugs, and the unintended consequences they entail, are not exclusive to Canada. In the United States, a recent study showed that the 2005 modification of price control policies within the Medicare public insurance plan contributed to the injectable drug shortages experienced by that country in recent years.[13] Drugs meant for patients covered by this program were much more likely to be in short supply than other drugs, thanks to the price caps imposed by the U.S. government, which significantly reduced their profitability.

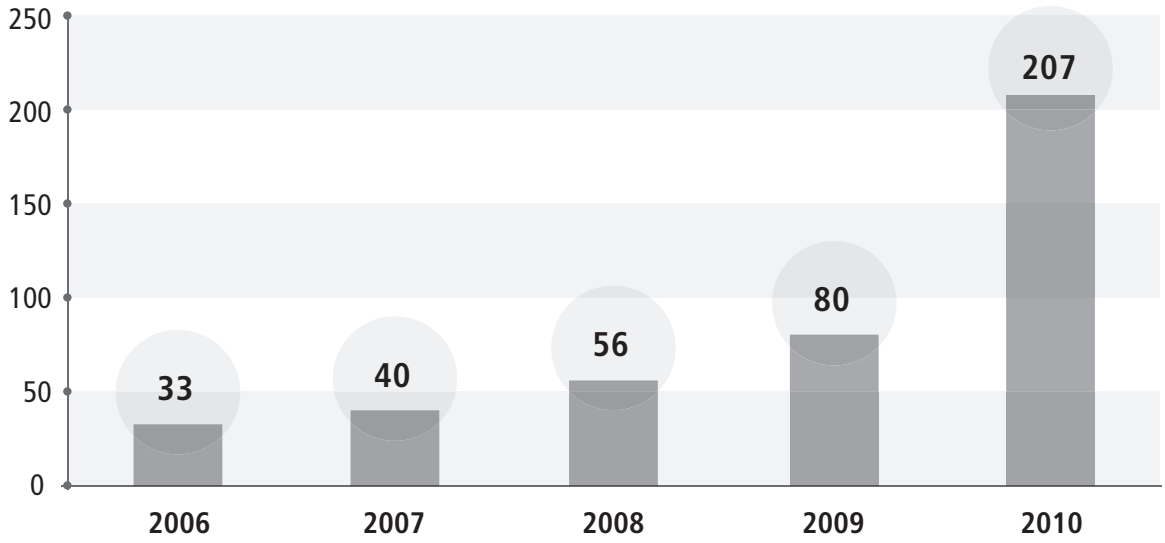
2.2 Prescription Drug Formularies

Before hoping to be able to market a new drug in Canada, every pharmaceutical manufacturer must receive prior approval from Health Canada. This federal organization examines the drug in order to ensure that it conforms to established norms of safety and quality.

Drugs that receive a notice of compliance from Health Canada are not automatically reimbursed by the public drug insurance plans, however. Manufacturers that want their products included on the reimbursable drug lists of the various provincial insurance plans must first submit the required documentation, in particular the results of clinical studies, to the *Common Drug Review* (CDR) and, in Quebec, to the *Institut national d'excellence en santé et en services sociaux* (INESSS), which is in charge of evaluating if the effectiveness of the products justifies the cost to be borne by the public plans (see section 2.3).

13. Ali Yurukoglu, *ibid.*

Figure 10
Number of notices of supply disruptions for prescription drugs in Quebec, 2006 to 2010



Source: RAMQ, cited in *Les ruptures d'approvisionnement en médicaments : un enjeu de santé publique qui nécessite des actions concertées,* Recommandations du Comité sur les ruptures d'approvisionnement en médicaments, March 2012, p. 13.

The purpose of using prescription drug formularies is once again to lower the prices of drugs entering the market. Since governments only agree to reimburse a certain number of drugs, this encourages manufacturers to set lower prices for their drugs in the hope that they will be reimbursed by the provincial public insurance plans.

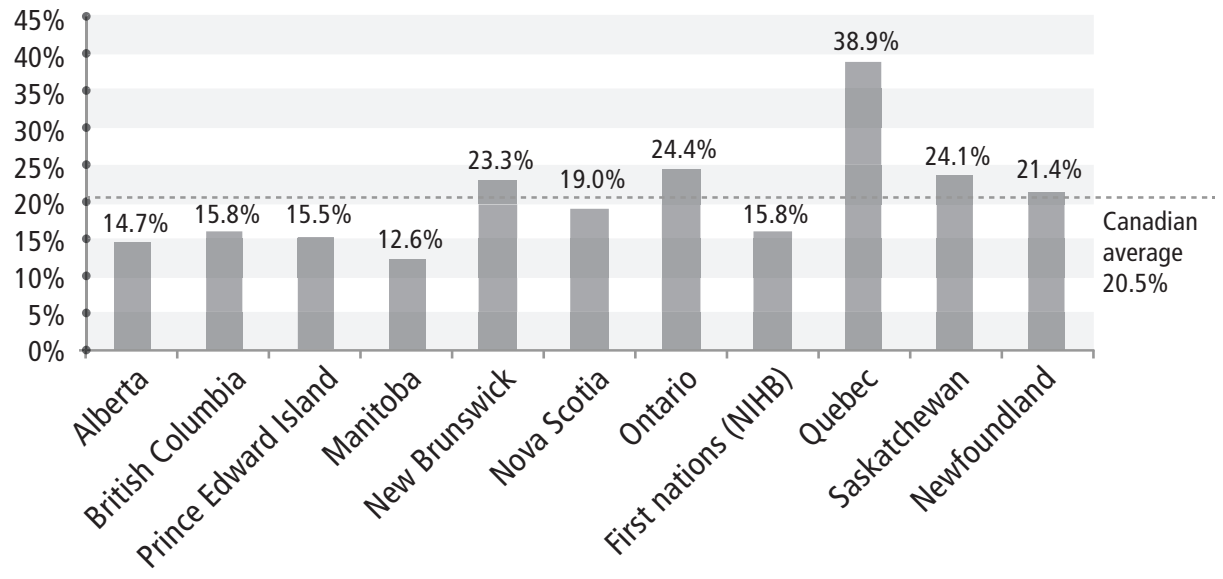
Several countries use prescription drug formularies as a way of containing expenditures, including Australia, France, Italy, Sweden, the United States (Veterans Health Administration) and New Zealand.[14] They manage to do so by restricting the number of reimbursable drugs and by delaying the addition of new drugs to their formularies (in the case of positive lists).[15]

Once again, international experience teaches us that good intentions are not enough and that this strategy is not without negative consequences. In the United States for example, the drug formulary policy used by the public health plan for war veterans (Veterans Health Administration) has significantly limited patients' access to new drugs, with negative repercussions in terms of life expectancy. Economist Frank Lichtenberg, who examined the program's effectiveness, found that veterans' life expectancy began to stagnate after 1997, contrary to that of the rest of the population, a result that he attributes to the adoption of this cost containment measure.[16]

In Canada, the reimbursement of new drugs by the various public insurance plans is also significantly restricted and delayed. Barely 21% of the new drugs approved by Health Canada from 2004 to 2011 could be found on the lists of reimbursable products covered by provincial drug insurance plans as of December 2012 (Figure 11). During this period, the average delay before new drugs became reimbursable by public plans was 659 days.[17]

14. Steve Morgan *et al.*, "Influencing drug prices through formulary-based policies: lessons from New Zealand," *Healthcare Policy*, Vol. 3 (2007), No. 1, pp. e121-e140.
15. Germany and the United Kingdom use what has become known as a "negative" list that includes only the drugs that those countries refuse to pay for. See Pedro Pita Barros, "Pharmaceutical policies in European countries," in Avi Dor (ed.), *Pharmaceutical markets and insurance worldwide (Advances in health economics and health services research, Volume 22)*, Emerald Group, 2010, pp. 3-27.
16. Frank R. Lichtenberg, *Older drugs, shorter lives? An examination of the health effects of the Veterans Health Administration Formulary*, Medical Progress Report No. 2, Manhattan Institute, October 2005.
17. Canadian Health Policy Institute, *How good is your drug insurance? Comparing federal, provincial and private-sector plans, 2004-2011. Annual Report – 2013 Edition*, January 30, 2013.

Figure 11
Percentage of drugs approved by Health Canada that are reimbursed by public drug insurance plans, average 2004-2011



Source: Canadian Health Policy Institute, *How good is your drug insurance? Comparing federal, provincial and private-sector plans, 2004-2011. Annual Report – 2013 Edition*, January 30, 2013, p.7.

The public drug insurance plans do not just limit the number of prescriptions drugs that they agree to reimburse, however. Certain products listed in their formularies are only reimbursed under exceptional circumstances for a limited, narrowly defined category of patients. This is particularly true of those known as exception drugs, which in some provinces require that a doctor make a special request to obtain reimbursement authorization, such as clopidogrel, a drug used to treat patients suffering from certain cardiac problems.

These measures have harmful effects on patients who find themselves deprived of the drugs they need or who have to wait before being able to get them. This can have serious health consequences for patients, as confirmed by a recent study looking at the data for Quebec. Indeed, the authors observed that out of 13,663 patients who had had a cardiac stent installed, those who were unable to obtain the required drug—clopidogrel— (11.5%) or who obtained it only after a one-day delay (8.6%) had a significantly higher risk of mortality than those to whom it was administered in a timely manner.[18]

18. Odile Sheehy, Jacques LeLorier and Stéphane Rinfret, "Restrictive access to clopidogrel and mortality following coronary stent implantation," *Canadian Medical Association Journal*, Vol. 178 (2008), No. 4, pp. 414-420.

2.3 Cost-Effectiveness Assessments of Drugs

In recent years, still with the aim of restricting the growth of health care spending, many governments around the world have adopted evaluation processes for new drugs in order to judge whether or not they offer sufficient benefits to justify their reimbursement by public insurance plans. These evaluations, known as pharmacoeconomic reviews, compare the added value of new drugs, not only in terms of therapeutic effectiveness but also in terms of cost, with existing treatments.[19]

In Canada, a centralized pharmacoeconomic evaluation process was created in 2003, the *Common Drug Review* (CDR), with the aim of making common recommendations to the various provincial drug insurance plans.[20] All of the provinces participate in this centralized process, which is overseen by the Canadian Agency for Drugs and Technologies in Health (CADTH), except for Quebec, which has set up its own evaluation agency for new drugs, the *Institut national d'excellence en santé et en services sociaux* (INESSS).

The decision-making tool commonly used by these agencies is based on cost thresholds per quality adjusted life year (cost/QALY). These thresholds actually serve to determine, in an arbitrary fashion, a maximum amount beyond which the public insurer will refuse or heavily restrict further reimbursement for a given drug. This amount can vary from one case to another but is generally somewhere around $50,000 per quality adjusted life year.[21] If the cost-effectiveness ratio of a drug exceeds this threshold, the agency does not recommend its coverage by provincial drug insurance plans, judging it too expensive for the benefits it provides.

In recent years, a good number of studies have criticized drug evaluation agencies' methods. Last January, a report funded by the European Commission even called into question the whole notion of relying on such pharmacoeconomic reviews.[22] Cost-effectiveness analyses are flawed not only because of the use of arbitrary indicators but also because they have negative effects on pharmaceutical innovation and access to new drugs.

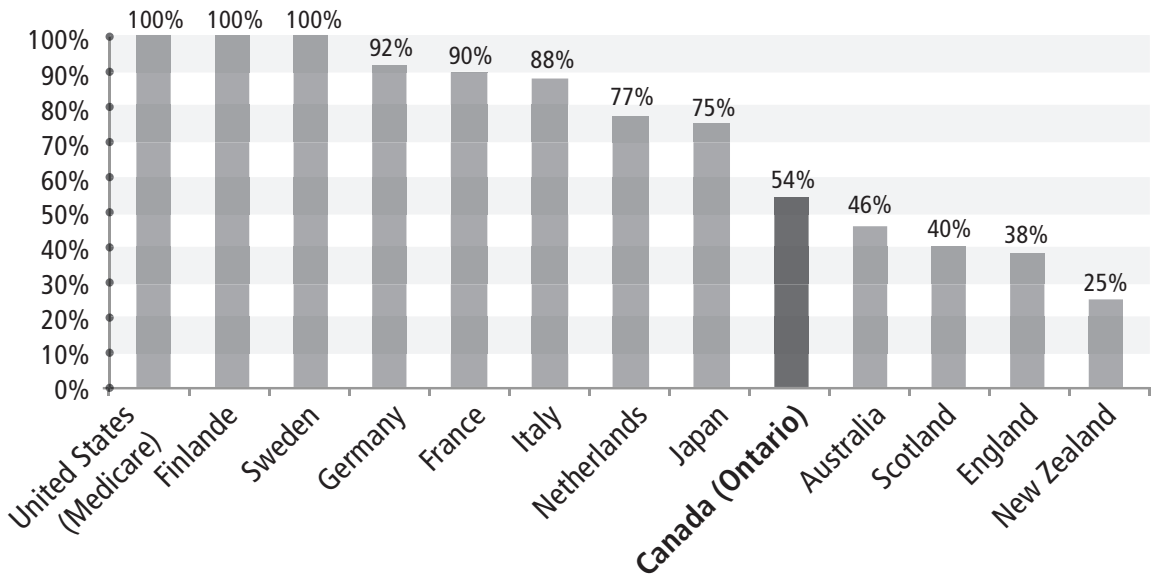
For example, a recent study compared conditions in the United States and in the United Kingdom and found that cost-effectiveness analyses have the effect of delaying, and even considerably restricting, patients' access to new drugs, especially cancer drugs.[23] Of 59 drugs approved by the United States' regulatory agency (FDA) from 2004 to 2008, all of them were covered by the country's two main public insurance plans (Medicare and Medicaid).[24] In contrast, the United Kingdom's evaluation agency (NICE) issued positive financing recommendations for just 18 of the 46 drugs (39%) that had been approved by the European Medicines Agency (EMA), four of which included restrictions on reimbursement by the public insurance plan (NHS).

Furthermore, while drugs were covered in the United States from the moment the FDA approved them, U.K. patients had to wait a little over two years on average, due to the NICE's evaluation delays, before being able to benefit from drugs that had received positive funding recommendations.

In Canada, a series of studies paint just as worrisome a picture of the impact of the *Common Drug Review* on access to required drugs. The proportion of drugs covered by the public insurance plans began to decline significantly after the establishment of the CDR in all Canadian provinces.[25]

19. Brigitte Laflamme *et al.*, *Accessibilité à des médicaments anticancéreux à caractère jugé prometteur : État des lieux et bilan du projet pilote*, Institut national d'excellence en santé et services sociaux, Quebec Government, September 2012, p. 5.
20. For cancer drugs, the evaluations are conducted in a centralized manner by the *pan-Canadian Oncology Drug Review* for all of the provinces, save Quebec.
21. Jonathan Trudel, "Le prix d'une vie," *L'actualité*, April 15, 2013, pp. 26-32. This threshold can be significantly higher is the case of cancer drugs. See in this regard Angela Rocchi *et al.*, "The role of economic incidence in Canadian oncology reimbursement decision-making: to lambda and beyond," *Value in Health*, Vol. 11 (2008), pp. 771-783.
22. -, "System used to decide whether drugs are cost-effective for NHS is flawed," *The Telegraph*, January 25, 2013.
23. Anne Mason *et al.*, "Comparison of anticancer drug coverage decisions in the United States and United Kingdom: Does the evidence support the rhetoric?" *Journal of Clinical Oncology*, Vol. 28 (2010), No. 20, pp. 3234-3238.
24. Only the public program for former soldiers (Veterans Affairs) imposes reimbursement restrictions on drugs approved by the FDA. See Anne Mason *et al.*, *ibid*.
25. John-Michael Gamble *et al.*, "Analysis of drug coverage before and after the implementation of Canada's Common Drug Review," *Canadian Medical Association Journal*, Vol. 183 (2011), No. 17, pp. e1259-e1266.

Figure 12
Percentage of all licensed indications reimbursed for 10 cancer drugs across 13 countries on February 28, 2010



Source: P. K. Cheema et al., "International variability in the reimbursement of cancer drugs by publically funded drug programs," *Current Oncology*, Vol. 19 (2012), No. 3, pp. e165-e176.

In a recent study comparing the cancer drug reimbursement decisions of 13 countries, a group of researchers found that Canada (using Ontario as the example) has one of the lowest reimbursement percentages, at 54%. Only Australia (46%), Scotland (40%), England (38%) and New Zealand (25%) reimbursed a lower proportion of drugs used to treat various cancers when the study was carried out in early 2010 (Figure 12).[26] As the authors note, those countries that resort to cost-effectiveness assessments are those that refuse to reimburse the highest percentage of drugs.

Another shortcoming and source of criticism of cost-effectiveness analyses stems from the fact that certain pharmacological treatments that do not make it past the threshold of acceptability could be very useful for certain kinds of patients for whom the currently available treatments covered by public insurance are either less effective or have more significant side effects. For instance, a group of economists showed that cost-effectiveness analyses of antipsychotic drugs used to treat schizophrenia, by depriving many patients of the drugs that are most effective for them, could not only in certain circumstances entail negative effects on their health but could also lead to greater increases in other kinds of expenses elsewhere in the health care system.[27]

Finally, pharmacoeconomic analyses, by taking for granted that the price of a drug will remain constant throughout the period during which it will be produced, ignores the dynamic nature of innovative pharmaceutical products, which have a tendency to become less expensive over time.[28] It often happens that treatments that are seen as very expensive when they are launched prove to be much more

26. P. K. Cheema *et al.*, "International variability in the reimbursement of cancer drugs by publically funded drug programs," *Current Oncology*, Vol. 19 (2012), No. 3, pp. e165-e176.

27. Anirban Basu, Anupam B. Jena and Tomas J. Philipson, "The impact of comparative effectiveness research on health and health care spending," *Journal of Health Economics*, Vol. 30 (2011), pp. 695-706.

28. Douglas Lundin and Joakim Ramsberg, "Dynamic cost-effectiveness: A more efficient reimbursement criterion," *Forum for Health Economics & Policy*, Vol. 11 (2008), No. 2, article 7.

interesting than previously thought following the publication of new data and the discovery of new therapeutic uses.[29] For example, the drug Ramipril, initially approved to treat hypertension, is now used to treat other pathologies, in particular kidney problems and a certain type of diabetes.

By rejecting certain drugs right from the start on the basis that their price is too high, public insurance plans therefore end up depriving many patients of the contribution of innovative drugs whose potential effectiveness is not yet fully known. There is also the risk of discouraging continued investment in R&D,[30] and ultimately, the development of new innovative drugs, especially those targeting rare diseases.

2.4 Bulk purchasing policies

For the past few years, a proposal has been gaining favour with political decision makers, that of purchasing prescription drugs in bulk. In August 2010, the Canadian provinces formed a coalition for the precise goal of setting up a national drug procurement strategy through competitive tendering.[31] More recently, during the meetings of the Council of the Federation held in the summer of 2012, provincial representatives announced their intention to adopt a centralized competitive bidding process for the purchase of six generic drugs.[32]

This strategy, currently used in the hospital sector, rests on a relatively simple principle. The buyers—whether they are hospitals, pharmacies or governments—solicit bids for the purchase of several drugs from interested suppliers. For each drug, a supply contract is signed, often with an exclusive supplier. By implementing this kind of collective process, the buyers hope to enjoy greater negotiating power with pharmaceutical companies, which should generally allow them to obtain better prices.

Several groups have warned the provinces of the dangers of adopting such a strategy on a national scale.[33] First and foremost, this practice entails the risk of compromising access to required drugs for many patients, insofar as it would limit their chances of obtaining alternative drugs designed by other manufacturers. It could also restrict doctors' ability to prescribe other drugs that they consider more effective in meeting their patients' needs. By underestimating the fact that patients do not all react the same way to particular medicines,[34] this approach would therefore unnecessarily expose some of them to the risk of worsening health.

Furthermore, such a practice is likely to push numerous manufacturers to gradually leave the market. Experience teaches us that bulk purchasing processes generally lead to greater concentration in the production of drugs, with a limited number of manufacturers sharing the market for each type of drug. In Canada, excessive use of this procurement method in hospitals is in all likelihood one of the reasons why the manufacturer Sandoz, blamed for the injectable drug shortages experienced in the spring of 2012, became the sole supplier of a multitude of crucial generic products.[35]

By promoting greater concentration in the supply of certain drugs, this system ultimately runs the risk of leading to higher prices. As pointed out by two Canadian experts: "[T]endering systems are likely to start off with considerable success because they take advantage of the existing competitive market; but over time they undermine that competitive

29. Peter Lindgren and Bengt Jönsson, "Cost-effectiveness of statins revisited: lessons learned about the value of innovation," *European Journal of Health Economics*, Vol. 13 (2012), pp. 445-450.
30. John A. Vernon *et al.*, "Fewer drugs, shorter lives, less prosperity: The impact of comparative effectiveness research on health and wealth," *Drug Information Journal*, Vol. 45 (2011), pp. 699-703; Anupam B. Jena and Tomas Philipson, "Cost-effectiveness as a price control," *Health Affairs*, Vol. 26 (2007), No. 3, pp. 696-703.
31. –, "New momentum for a pan-Canadian purchasing alliance for prescription drugs," *Canadian Pharmacists Journal*, Vol. 143 (2010), No. 6, pp. 264-265.
32. The Council of the Federation, *From Innovation to Action: The First Report of the Health Care Innovation Working Group*, August 2012, p. 20.
33. Aidan Hollis and Paul Grootendorst, *Tendering generic drugs: what are the risks?* Paper commissioned by the Canadian Generic Pharmaceutical Association, October 2012; Canadian Pharmacists Association.
34. William E. Evans and Howard L. McLoad, "Pharmacogenomics – Drug disposition, drug targets and side effects," *The New England Journal of Medicine*, Vol. 348 (2003), No. 6, pp. 538-549.
35. Emily Jackson, "Drug shortages: single supplier for generic injectables at root of crisis in Canada," *Toronto Star*, March 17, 2012.

market, leading to higher prices in the future."[36]

Some countries around the world already use this strategy of granting contracts to an exclusive supplier, with mitigated success. Their experience can teach us a lot about the unintended consequences that this kind of centralized approach could entail if adopted on a Canada-wide basis.

In New Zealand, for example, criticisms were expressed after the adoption of such a process by the public agency PHARMAC was accompanied by an increase in the number of pharmaceutical products subject to shortages.[37] A recent study showed that the centralized bulk purchasing strategy in New Zealand hospitals only led to relatively modest savings (6-8% per year) while entailing numerous unintended consequences. Many hospitals observed a drop in the quality of the products and services obtained and deplored the absence of choices available to them.[38] Among other things, the administrators interviewed revealed that they had regularly been faced with drug shortages, some of which took over a year to be resolved.

Nor is there any guarantee that the competitive tendering process and procurement from exclusive suppliers lead to savings, once total costs are taken into account (including indirect costs). By forcing patients to change their medicine for the one offered by the unique supplier, there is actually a risk that such a policy will lead to adherence problems or more serious side effects and therefore entail other expenses elsewhere in the health care system. In Denmark and Germany, for instance, it was observed that patients who were required to change drug types were less likely to adhere to their treatments.[39] In Belgium, cost reduction goals were not met, and the single supplier policy was actually abandoned after generic drug manufacturers all decided to no longer participate in the competitive tendering process.[40]

In certain cases, public authorities are able to reap some savings with such an approach, but at the expense of patients covered by private insurance, who see their bills climb. For instance, in British Columbia, where the public insurer has signed agreements with a single retail market supplier for olanzapine (a drug used to treat schizophrenia), economists have estimated that patients covered by private insurance (and those covered by public insurance with copayment) had to pay out up to 63% more to buy the drug.[41] Thus, spending was merely displaced and the policy generated no real savings.

In the end, we find that the presence of a single buyer (monopsony) in a market entails unintended consequences just as harmful as the presence of a single seller (monopoly). When applied to generic drugs, the practice of centralized bulk purchasing clearly increases the risk of drug shortages without generating the anticipated savings. By extending it to cover innovative drugs, decision makers would risk discouraging investment in R&D and inhibiting innovation.

2.5 Toward a National Drug Insurance Plan?

For a few years now, several groups in Canada have been proposing the adoption of a pan-Canadian public drug insurance plan that would cover prescription drug costs for the entire population.[42] Representatives of these groups maintain among other things that a national plan would be in a better position to contain drug costs than a mixed public-private system managed by the provinces

36. Aidan Hollis and Paul Grootendorst, *op. cit.,* note 33, p. 18.
37. Pippa MacKay, "Is PHARMAC's sole-supply tendering policy harming the health of New-Zealanders?" *New Zealand Medical Journal*, Vol. 118 (2005), No. 1214.
38. June M. Tordoff *et al.*, "'Price management' and its impact on hospital pharmaceutical expenditure and the availability in New Zealand hospitals," *Value in Health*, Vol. 11 (2008), No. 7, pp. 1214-1226.
39. Peter Dylst, Arnold Vulto and Steven Simoens, "Tendering for outpatient prescription pharmaceuticals: what can be learned from current practices in Europe?" *Health Policy*, Vol. 101 (2011), pp. 146-152.
40. *Ibid.*, p. 149.
41. Aidan Hollis, *Generic drug pricing and procurement: A policy for Alberta*, SPS Research Papers Vol. 2, No. 1, School of Policy Studies, University of Calgary, February 2009, pp. 25-26.
42. See especially Marc-André Gagnon and Guillaume Hébert, *The Economic Case for Universal Pharmacare: Costs and benefits of publicly funded drug coverage for all Canadians,* Canadian Centre for Policy alternatives, September 2010; Greg Marchildon, "Federal pharmacare: prescription for an ailing federation," *Inroads*, Vol. 18 (2006), pp. 94-108; Steve Morgan, "Single-payer pharmacare would save billions," Healthydebate.org, February 13, 2013.

like the one actually in effect in this country. To flesh out their proposal, they emphasize that such a plan would give the public insurer greater negotiating power with pharmaceutical companies, which would allow it to obtain significant concessions in terms of drug prices.

But far from generating substantial economies like supporters of a nationalized drug insurance plan would have us believe, such a program would instead risk increasing the burden currently weighing down public finances. An analysis carried out in 2002 estimated that public spending on prescription drugs would go up by more than $8 billion a year with the adoption of a national drug insurance plan financed and managed exclusively by government, a 147% increase.[43] The bill would likely be significantly higher for the federal purse if these numbers were updated. Economists recently calculated that collecting an additional dollar of tax revenue, taking into account current tax levels in Canada, would cost as much as $1.26.[44]

Putting a pan-Canadian public insurance plan in place would not only entail extra costs for taxpayers, but would do nothing to change governments' current propensity to restrict access to new drugs. Once again, foreign experience can teach us much about the dangers of adopting a monopolistic drug insurance system in Canada.

The United Kingdom is without a doubt the country that has pushed this line of thinking the furthest. Since the 1990s, one cost containment policy after another has been adopted, and patients are still suffering the repercussions. For example, U.K. patients for many years had to do without drugs that were approved and recognized as effective and available all across Europe. This is still the case for a number of cancer drugs like Nexavar[45] (liver cancer), Avastin[46] (intestinal cancer) and Torisel[47] (kidney cancer) which have all proven their effectiveness.[48] These restrictions have in all likelihood played a role in the lower survival rates for various cancers in the United Kingdom compared to other developed countries.[49]

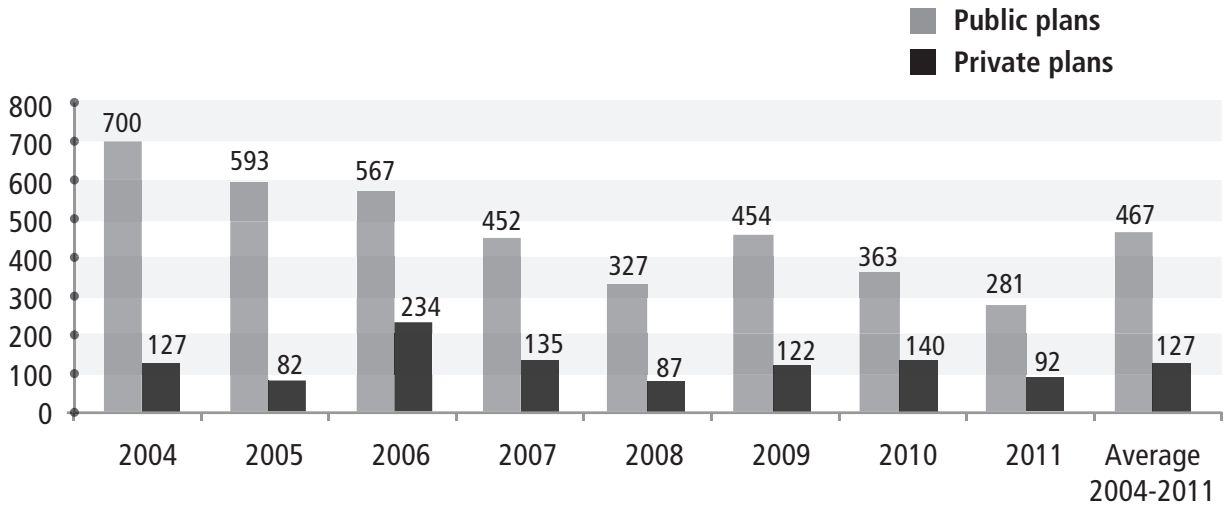
In New Zealand, another country where the public insurer occupies a prominent place, patients' access to innovative drugs is just as restricted as it is in the United Kingdom, if not more so.[50] Several reports have been published demonstrating the negative health consequences of the cost containment policies adopted in that country over the past fifteen years or so.[51]

The advantages of private insurance plans

Private insurers in Canada offer a clearly more generous coverage of prescription drugs than the public insurance plans. An analysis carried out at the beginning of the year found that 81% of new drugs approved by Health Canada between 2004 and 2011 are covered by at least one private plan in Canada,

43. Palmer D'Angelo, *Cost impact study of a national pharmacare program for Canada*, September 2002.
44. Bev Dahlby and Ergete Ferede, *What does it cost society to raise a dollar of tax revenue? The marginal cost of public funds*, Commentary No. 324, C.D. Howe Institute, March 2011.
45. National Institute for Health and Care excellence, "Liver cancer drug not recommended for the NHS," Press Release, May 25, 2010.
46. National Institute for Health and Care excellence, "Avastin (bevacizumab) is not recommended for the treatment of metastatic breast cancer in new guidance from NICE," Press Release, February 23, 2011.
47. National Institute for Health and Care excellence, "NICE publishes guidance on three cancer drugs," Press Release, October 27, 2010.
48. Scott Wilhelm *et al.*, "Discovery and development of sorafenib: a multikinase inhibitor for treating cancer," *Nature Reviews Drug Discovery*, Vol. 5 (2006), pp. 835-844; Axel Grothey *et al.*, "Bevacizumab beyond first progression is associated with prolonged overall survival in metastatic colorectal cancer: results from a large observational cohort study (BRiTE)," *Journal of Clinical Oncology*, Vol. 26 (2008), No. 33, pp. 5326-5334; Gary Hudes *et al.*, "Temsirolimus, interferon alfa, or both for advanced renal-cell carcinoma," *The New England Journal of Medicine*, Vol. 356 (2007), pp. 2271-2281.
49. Michael P. Coleman *et al.*, "Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995-2007: An analysis of population-based cancer registry data," *The Lancet*, Vol. 377 (2011), pp.127-139; Holger Moller, Gavin Flatt and Anthony Moran, "High cancer mortality rates in the elderly in the UK," *Cancer Epidemiology*, Vol. 35 (2011), pp. 407-412.
50. Rajan Ragupathy *et al.*, "A 3-dimensional view of access to licensed and subsidized medicines under single-payer systems in the US, the UK, Australia and New Zealand," *Pharmacoeconomics*, Vol. 30 (2012), No. 11, pp. 1051-1065; P. K. Cheema *et al.*, "International variability in the reimbursement of cancer drugs by publically funded drug programs," *Current Oncology*, Vol. 19 (2012), No. 3, pp. e165-e176.
51. See especially Chris Ellis and Harvey White, "PHARMAC and the statin debacle," *The New Zealand Medical Journal*, Vol. 119 (2006), No. 1236, pp. 84-94; Jacques LeLorier and NSB Rawson. "Lessons for a national pharmaceuticals strategy in Canada," *Canadian Journal of Cardiology*, Vol. 23 (2007), No. 9, pp. 711-718.

Figure 13
Average delay (in days) before authorizing the reimbursement of new drugs, public versus private insurance plans, 2004-2011



Source: Canadian Health Policy Institute, *How good is your drug insurance? Comparing federal, provincial and private-sector plans, 2004-2011. Annual Report – 2013 Edition*, 30 janvier 2013.

whereas only 47% are covered by at least one public plan. Moreover, new drugs are made available to patients much more rapidly. Between 2004 and 2011, patients covered by private plans waited an average of 127 days before having access to new drugs approved by Health Canada, versus 467 days for patients covered by public plans (Figure 13).[52]

These differences in access can translate into substantial discrepancies in terms of health results. In one study of patients with HIV/AIDS in the United States, researchers found that holders of private insurance policies had a much lower risk of death from the disease than those insured by public plans.[53] The reasons for this state of affairs are unequivocal according to the authors: the holders of private insurance policies enjoyed better coverage, enabling them to obtain better drugs more rapidly than those insured by public plans.

Private insurance also confers advantages that go well beyond the generosity of coverage to encompass other aspects. Private insurance plans generally offer more choice and flexibility than public plans, and services that are better adapted to the needs of their clientele. In countries with a variety of insurers, what we find is that the population is ready to pay more for private insurance plans that offer more generous coverage and higher quality services.[54]

Obviously, private insurers also put in place strategies aiming to optimize spending on drugs. It is in their interest to do so in order to guarantee the viability of their insurance plans. For instance, many insurance companies have initiatives to raise client awareness, especially regarding the true costs of drugs, ways to become well-informed consumers, and the importance of properly adhering to one's

52. Canadian Health Policy Institute, *How good is your drug insurance? Comparing federal, provincial and private-sector plans, 2004-2011. Annual Report – 2013 Edition*, January 30, 2013.

53. Jayanta Bhattacharya, Dana Goldman and Neeraj Sood, "The link between public and private insurance and HIV-related mortality," *Journal of Health Economics*, Vol. 22 (2003), No. 6, pp. 1105-1122.

54. John A. Romley *et al.*, "Survey results show that adults are willing to pay higher insurance premiums for generous coverage of specialty drugs," *Health Affairs*, Vol. 31 (2012), No. 4, pp. 683-690; Bernard van den Berg *et al.*, "Preferences and choices for care and health insurance," *Social Science & Medicine*, Vol. 66 (2008), pp. 2448-2459; Harry Telser and Peter Zweifel, "A new role for consumers' preferences in the provision of healthcare," *Economics Affairs*, Vol. 26 (2006), No. 3, pp. 4-9.

prescription.[55] These awareness-raising strategies do not necessarily entail additional expenses insofar as they lead to improved adherence to treatments[56] and possibly to reductions of other expenses elsewhere in the health care system. So, contrary to public plans that bank on rationing policies, private plans try to optimize expenses through targeted measures that improve efficiency.

Private companies can also adopt measures that are more similar to those put in place by governments, like the substitution of generic drugs once they become available. However, these strategies are not adopted by all companies in a uniform manner for everyone. The advantage of this as compared to a public plan is not slight. Contrary to the public insurer that has a captive clientele, private insurers must take client preferences into account when making drug coverage decisions, not only in terms of cost but also in terms of the quality of services rendered.

For example, if it should happen that in the eyes of the insured, a cost containment strategy were unsatisfactory, in particular because it restricted the generosity of coverage and access to new drugs, the private insurer who had put it in place could see its clients turning to its competitors in greater numbers and would therefore be penalized. In the end, it is therefore the insured who largely dictate the choices available.

On the other hand, socializing a larger part of drug spending through a national drug insurance plan would give more power to government and its bureaucrats to make decisions and negotiate on behalf of the insured. Policies to restrict spending would be applied across the board and would penalize all Canadians in the same way. Many of them would therefore have to settle for lower-quality drug insurance coverage than they currently enjoy.

55. Jean-François Chalifoux, *Pourquoi un régime mixte au Québec?* Speech given at the 18th Regional conference of the Canadian Pension & Benefits Institute, September 11, 2012.
56. Joseph P. Newhouse and Anna Sinaiko, "Can multi-payer financing achieve single-payer spending levels?" *Forum for Health Economics & Policy*, Vol. 10 (2007), No. 1, Art. 2.

CHAPTER 3

The Importance of Having Timely Access to Drugs

Instead of trying to control costs through measures based on regulation, centralization and rationing, governments should instead reduce the obstacles to accessing new drugs. This would allow patients to benefit more quickly from the numerous advantages of these drugs.

3.1 Access to New Drugs

At the international level, the data compiled by various studies show that there are significant discrepancies in the chances of patients having access to new innovative drugs, especially when it comes to cancer treatments. Whereas patients can generally benefit quickly from new pharmaceutical treatments in the United States, Switzerland, Austria and France, new drugs take longer to be made available to patients in Canada, the United Kingdom, Australia and New Zealand.

As mentioned above, it is now recognized that differences in access to modern treatments and abnormally long delays when waiting for new drugs have repercussions on the survival rates of patients suffering from various health problems.[1] Quick access to new therapeutic advances and innovative drugs is especially important for cancer patients.

While Canada seems to place well compared to other countries in terms of survival rates for various cancers, there remains a source of concern: Long delays for approval and marketing authorization, as well as the different drug insurance plans' multiple reimbursement restrictions, hamper patients' timely access to required drugs. According to the Auditor General of Canada, "delays in approving new drug submissions mean that access to the potential benefits of these drugs is delayed."[2]

According to a recent study, Health Canada's approval delays are markedly longer than delays in the United States. On average, it takes almost a year for a drug to get marketing approval from Health Canada. From 2001 to 2010, the median delay required to complete the evaluation process for new drugs was 303 days in the United States versus 352 days in Canada.[3]

As for cancer drugs, from 2003 to 2011, the median time devoted to their evaluation was almost twice as long in Canada (356 days) as it was in the United States (182 days).[4]

The case of the FDA in the United States

The United States has succeeded in considerably reducing approval delays for new drugs over the past two decades. In the 1980s, it often took the Food and Drug Administration (FDA) over two years to examine new drugs and render a decision. As a result, over 70% of drugs were approved first outside the United States.[5] This state of affairs has completely reversed itself since then, and now the FDA manages to approve over 70% of new drugs before any other, foreign regulatory agency (data for 2011).[6]

The turning point was the *Prescription Drug User Fee Act*, adopted by Congress in 1992. A response to the lengthening approval delays for drugs observed in the 1980s, the new law now partially links the payment of fees by manufacturers to the

1. Bengt Jönsson and Nils Wilking, "The effect of cancer drug vintage on cancer survival and mortality," *Annals of Oncology*, Vol. 18 (2007), Suppl. 3, pp. iii67-iii77.
2. Office of the Auditor General of Canada, *Regulating Pharmaceutical Drugs—Health Canada*, Report of the Auditor General to the House of Commons, Chapter 4, Fall 2011.
3. Nicholas S. Downing *et al.* "Regulatory review of novel therapeutics – comparison of three regulatory agencies," *The New England Journal of Medicine*, Vol. 367 (2012), pp. 2284-2293.
4. Nigel S.B. Rawson, *Access to new oncology drugs in Canada compared with the United States and Europe*, Fraser Alert, Fraser Institute, July 2012.
5. PhRMA, *The Prescription Drug User Fee Act (PDUFA) Provides a Transparent and Efficient Process for FDA Review of New Medicines and Treatment.*
6. Margaret A. Hamburg, *Reauthorization of PDUFA: What It Means for Jobs, Innovation, and Patients*, Testimony before the Subcommittee on Health Committee on Energy and Commerce of the U.S. House of Representatives, February 1, 2012.

attainment of performance targets by the FDA in terms of its evaluation processes for new drugs. Studies show that the incentives created by this law significantly contributed to reducing approval delays (Figure 14).[7] It also encouraged pharmaceutical companies to put more money into R&D.[8]

Contrary to concerns expressed at the time, the reduction in approval delays by the FDA did not occur at the expense of patient safety. Researchers who looked into the matter found no correlation between the FDA's shorter review delays and the number of undesirable events associated with the taking of drugs.[9] On the other hand, the reform's benefits to the population in terms of health and life expectancy have been considerable. Researchers estimated that quicker access to drugs following the adoption of the new law may have led to gains equivalent to an additional year of life for between 140,000 and 310,000 people.[10]

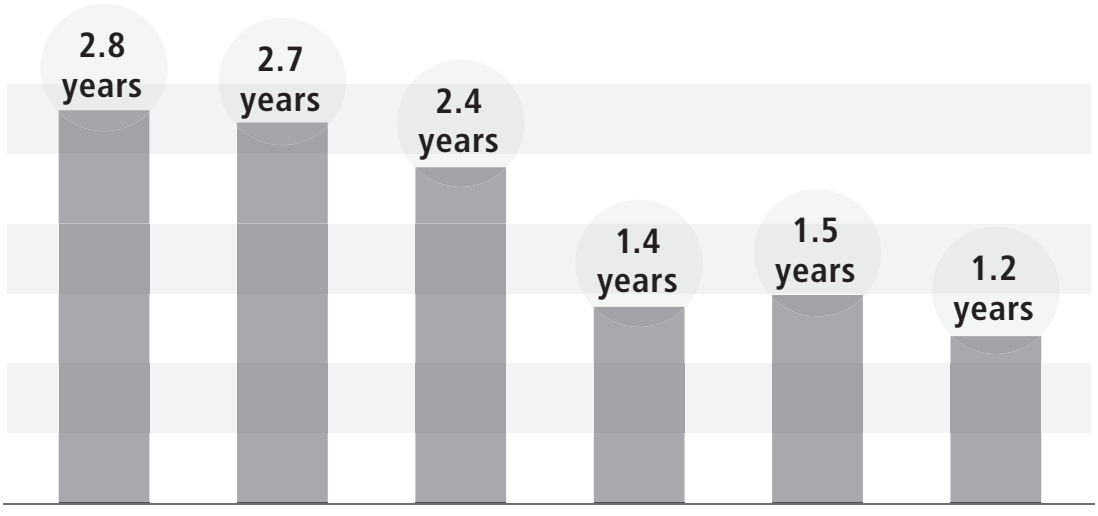
3.2 Eliminating Prescription Drug Import Restrictions

By all accounts, the extended delays and high costs faced by manufacturers that want to obtain approval for their drugs from Health Canada makes many foreign pharmaceutical companies reluctant to launch their products on the Canadian market.

The most promising approach to circumvent this problem would be to set up a process of collaboration between Health Canada and foreign

7. Mary K. Olson, "PDUFA and initial U.S. drug launches," *Michigan Telecommunications and Technology Law Review*, Vol. 15 (2009), pp. 393-416.
8. John A. Vernon *et al.*, "An exploratory study of FDA new drug review times, prescription drug user fee acts, and R&D spending," *Quarterly Review of Economics and Finance*, Vol. 49 (2009), pp. 1260-1274.
9. Henry G. Grabowski and R. Wang, "Do faster Food and Drug Administration drug reviews affect patient safety? An analysis of the 1992 Prescription drug user fee act," *Journal of Law and Economics*, Vol. 51 (2008), pp. 377-406.
10. Tomas Philipson, Ernst R. Berndt, Adrian H.B. Gottschalk and Eric Sun, "Cost-benefit analysis of the FDA: the case of the prescription drug user fee acts," *Journal of Public Economics*, Vol. 92 (2008), pp. 1306-1325.

Figure 14
Average delay (in years) for the approval of new drugs by the FDA in the United States, 1980-2009



Source: KI Kaitin and JA DiMasi, "Pharmaceutical innovation in the 21st century: New drug approvals in the first decade, 2000-2009," *Clinical Pharmacology & Therapeutics*, Vol. 89 (2011), No. 2, p. 185.

regulatory agencies. For instance, the federal government could sign agreements with other countries whereby prescription drugs already approved in those countries could undergo an accelerated approval process and enter the Canadian market more quickly, and vice versa.[11]

Currently, Health Canada only exceptionally allows the importation of alternative drugs that are not authorized to be sold and distributed on the Canadian market, when the urgency of the situation demands it.[12] Recently, Health Canada reacted to the shortage of injectable drugs experienced here by temporarily authorizing the importation of equivalent drugs that it had not yet approved.[13]

Why does Health Canada only apply this accelerated approval process in times of crisis? There is no reason to believe that similar drugs produced and approved in other developed countries could not be purchased and marketed quickly in Canada. This strategy would not only reduce inconvenience for patients, but by increasing competition, it would also encourage Canadian manufacturers to invest more in order to avoid supply disruptions. The risks of shortages would be greatly reduced and patients could benefit more rapidly from new drugs that have entered the market.

11. Health Canada recently concluded an agreement of this type with the FDA in the U.S., regarding a drug used by veterinarians. Health Canada, *Flea control product gets green light under Regulatory Co-operation Council project*, Press Release, December 14, 2012.
12. To find out more, see Health Canada, *Special Access Programme – Drugs*, http://www.hc-sc.gc.ca/dhp-mps/alt_formats/hpfb-dgpsa/pdf/acces/sapfs_pasfd_2002-eng.pdf.
13. Letter to Editor regarding the article "La pénurie de médicaments" (*Journal de Montréal* - April 1, 2012), April 1, 2012.

CONCLUSION

In Canada, governments are increasingly resorting to policies aimed at slowing the growth of spending on pharmaceuticals. The provinces are pursuing strategies in this direction based on even greater centralization and regulation.

Of course, no one can blame them for wanting to manage public finances more rigorously and make more careful use of public funds. Spending on prescription drugs must not be looked at in isolation, though. Many drugs replace more expensive medical procedures, thereby producing savings elsewhere in the health care system.

Cost containment policies entail negative consequences for the Canadian population. They not only have the effect of reducing patients' access to current drugs, but also of discouraging investment in R&D, which is what leads to the advent of new drugs in the future.

Instead of moving in this direction, governments should look for ways to help the pharmaceutical industry innovate and accelerate the entry of new drugs onto the market, which as we have seen would benefit patients in numerous ways.

About the author

YANICK LABRIE

YANICK LABRIE is an economist and health care policy analyst at the Montreal Economic Institute. He holds a bachelor's degree in economics from Concordia University and a master's degree in economics from the Université de Montréal. Before joining the MEI, he taught economics at CEGEP St-Jean-sur-Richelieu and lectured at HEC Montréal's Institute of Applied Economics.

He is the author of several studies and articles analyzing different countries' healthcare policies in general, and pharmaceutical issues in particular. Many of his articles on these topics have appeared in the *National Post, The Gazette, The Province, La Presse* and other newspapers. He also has a weekly radio column during a Montreal-area station's morning show and holds a blog with *Huffington Post Canada*.

He is also frequently invited to participate in conferences and debates, and to comment on economic affairs in the media. He recently spoke at national conferences in Montreal and Toronto on the lessons to be learned from the French and German health care systems.

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